REMARKS

Reconsideration and allowance of this application, as amended, is respectfully requested.

This Amendment is in response to the Office Action mailed December 22, 2005.

By the present amendment, claims 1-4 have been canceled, without prejudice to the applicants' right to proceed with the subject matter of these claims in a continuation application. In their place, new claim 5 has been added to clarify the invention. With regard to this, it is noted that claim 5 is directed to a semiconductor device manufacturing method similar to previously pending claim 2, and, as such, corresponds to the elected invention. However, claim 5 further defines the arrangements for measuring the ion current density, as will be discussed below.

Briefly, claim 5 defines features shown, for example, in Figs. 1-3 and 7 and 8, as discussed on pages 9, 10 and 23 of the application. In particular, in accordance with a semiconductor device manufacturing method of the present invention, the ion current density of a plasma is measured using an ion current measuring instrument which includes a first conductive layer or first semiconductor layer (such as shown by the numeral 1 in Fig. 1, 2, 3, 7 and 8) formed on or above a wafer being processed by a plasma processing apparatus, together with a first insulating layer (e.g., indicated by the numeral 2) formed on the first conductive (or semiconductor) layer, a second conductive layer (e.g., 4) formed on the first insulator layer, and a second insulating layer (e.g., 5) formed on the second conductive layer. As also shown in Figs. 1, 2, 3, 7 and 8, a groove is formed in the second insulating layer 5 that reaches the second conductive layer 4, and an ion current flowing region is formed in a region in which a thickness of the first insulating layer is made locally thin (e.g., see

particularly the illustration of the thin region of the insulating film 2 in Fig. 3). By virtue of this arrangement, as discussed in the summary of the invention on page 3, it is possible to measure the current density of ions which are launched into the wafer without installing electrical wiring through the plasma processing apparatus and without making special arrangements for the wafer or the wafer supporting member. This provides a method which is extremely suitable for mass production at reduced costs.

Reconsideration and removal of the objection to the drawings set forth in paragraph 3 of the Office Action, the objection to claim 3 set forth in paragraph 4 of the Office Action, and the 35 USC §112, second paragraph rejection of claims 2 and 3 set forth in paragraph 5 of the Office Action is respectfully requested. In each case, these objections and rejections have been obviated by the canceling of the claims 1-4 (noting that the newly presented claim 5 does not contain any of the language objected to or rejected under 35 USC §112 in the Office Action. Therefore, removal of the objections and the 35 USC §112 rejection is earnestly solicited.

Similarly, reconsideration and allowance of the newly presented claim 5 over the cited Prior Art to Nogami (USP 6,436,304) and Hashimoto (USP 5,779,925), whether considered alone or in combination with each other or the other cited Prior Art in this case, is respectfully requested. As noted above, by the present Amendment, newly presented claim 5 defines a semiconductor manufacturing method which specifically measures ion current density in the plasma using an ion current measuring instrument which includes a first conductive layer or first semiconductor layer formed on or above a wafer, a first insulating layer formed on the first conductive layer or first semiconductor layer, a second conductive layer

formed on the first insulator layer, a second insulating layer formed on and around the second conductive layer, a groove formed in the second insulating layer that reaches the second conductive layer to provide an exposed region on the bottom of the groove, and an ion current flowing region formed by a region where the thickness of the first insulating layer is made locally thin. The use of this current measuring instrument with this defined structure permits checking the plasma processing apparatus based on the ion current density measurement and manufacturing the semiconductor device with the checked plasma processing apparatus.

As discussed on page 16, lines 10-25 of the Specification, this structure effectively shields undesirable electrons from reaching inside the groove so that substantially only ions reach the second conductive layer at the bottom of the groove. This permits a very accurate measurement of the ion current, and substantially improves the reduction of faults during the manufacturing of the semiconductor devices.

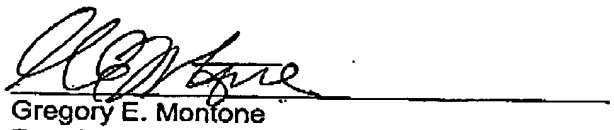
It is respectfully submitted that there is nothing in either Nogami or Hashimoto, whether considered alone or in combination with one another or other cited Prior Art in this case, which would at all suggest the claimed method utilizing the specific ion current measuring instrument defined in claim 5 to measure the ion current density and check the plasma processing apparatus based upon the measured ion current density. With regard to this, it is noted that although Hashimoto is directed to measuring plasma current by approximating a probe to a wafer, it certainly does not teach or suggest the claimed step of measuring an ion current density of the plasma using the specific ion current measuring instrument defined in claim 5. Therefore, nothing in Hashimoto or Nogami would suggest any arrangement for meeting the terms of the present claim 5 or, for that matter,

obtaining the extremely accurate ion current density measurement which is possible using the invention set forth in claim 5. Therefore, reconsideration and removal of the rejections based on Nogami and Hashimoto is respectfully requested.

If the Examiner believes that there are any other points which may be clarified or otherwise disposed of either by telephone discussion or by personal interview, the Examiner is invited to contact Applicants' undersigned attorney at the number indicated below.

To the extent necessary, applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in the fees due in connection with the filing of this paper, to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Dep. Acct. No. 01-2135 (500.40410VX1), and please credit any excess fees to such deposit account.

Respectfully submitted,
ANTONELLI, TERRY, STOUT & KRAUS, LLP



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